Noninvasive Ventilation Therapy
Treating your respiratory conditions

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Noninvasive ventilation (NIV)—treating your respiratory conditions

If you have a breathing problem due to weak muscles or a lung condition, your clinician may recommend a type of therapy called noninvasive ventilation.

Human lungs serve as a collection and distribution center for oxygen and carbon dioxide (see page 4 for details). When you have a respiratory condition, NIV therapy can support your breathing and help your body perform these functions more effectively.

ResMed offers a wide range of devices for every patient’s individual needs:

- The VPAP™ range includes ResMed’s premium NIV systems, ideal for nighttime ventilation.
- ResMed’s ventilators are light, quiet and portable, providing nondependent patients with quality ventilation night and day.

What is NIV?

NIV is a form of assisted ventilation, providing air to your airways and lungs. This therapy is called “noninvasive” because it delivers air via a mask or mouthpiece—unlike invasive types of ventilation that require the insertion of a tube in the windpipe.

A ventilation device enhances your breathing and helps reduce the amount of effort required when taking a breath.

Your clinician will prescribe the level of pressure best suited to your therapy needs.
What are the benefits of NIV?

- **Can make day-to-day activities easier:**
  By easing the work of breathing, effective NIV therapy may give you more energy and flexibility to pursue everyday activities.

- **Helps alleviate a range of symptoms:**
  Morning headaches, daytime fatigue and shortness of breath are just some of the daytime symptoms that may occur due to inadequate ventilation—that is, low levels of oxygen (O\textsubscript{2}) and accumulated carbon dioxide (CO\textsubscript{2}). By managing CO\textsubscript{2} and O\textsubscript{2} levels in your body, NIV therapy helps relieve symptoms over time to improve your quality of life.

- **Reduces the risk of worsening infection:**
  NIV helps improve sleep quality. The more rested you are, the sooner you are likely to recover from colds and other infections. Improved sleep is the first line of defense against such infections.

- **Reduces time in hospital:**
  Studies* indicate that NIV reduces hospitalization by stabilizing your breathing and improving the quality of your sleep. Adequate ventilation may help avoid respiratory failure. Often prescribed for treatment in your own home, NIV is effective and more convenient.

* References to specific studies available on request
How do my lungs function?

- Think of your lungs as a collection and distribution center. They collect O₂ from the air you breathe and distribute it to the rest of your body. They collect CO₂ from your body and remove it through the air that you breathe out.

- Our lungs consist of millions of alveoli—small air sacs. Through the walls of these air sacs, O₂ and CO₂ are exchanged between the lungs and blood.

What types of diseases can affect my respiratory system?

Three main types of diseases can weaken your lungs, chest wall or chest wall muscles, impairing their performance.

- **Restrictive diseases:** As the name suggests, these diseases restrict movement of the lungs, preventing adequate ventilation. This can be seen where there are weakened chest wall muscles or abnormalities in the chest wall.

- **Obstructive diseases:** The obstruction or narrowing of small airways in the lungs causes these diseases, which are often characterized by difficulty exhaling.

- **Obesity hypoventilation syndrome (OHS):** This condition is defined by a combination of obesity and a high level of carbon dioxide in the blood. During spontaneous breathing at rest, people with OHS need significantly greater effort to breathe than those of normal weight.

**Healthy lung function:** As seen in the magnified view, air can flow quite easily into and out of the alveoli (small air sacs in the lungs).
How do these diseases affect my breathing?

- Consistent airflow to your lungs with an adequate volume of air is essential to balance levels of $O_2$ and $CO_2$ in your body.
- When the body consumes $O_2$ to generate energy and maintain activities, $CO_2$ is produced.
- When your respiratory system is impaired and the air delivery is limited, levels of $O_2$ and $CO_2$ in your body become unbalanced.
- You may hear the term “hypoventilation,” which literally means under-ventilated.

Example of COPD breathing

$CO_2$ air trapped

The obstruction or narrowing of small airways can cause $CO_2$ to remain trapped inside the lungs.

How does NIV help my breathing?

- NIV assists in the ventilatory process by increasing the volume of air moving in and out of your lungs.

How does a ResMed ventilator benefit my therapy?

Designed for excellence in noninvasive ventilation, ResMed’s ventilators offer you a range of unique therapy benefits.

- **Responding to you:** ResMed ventilators sense when you breathe in and when you breathe out, matching their rhythm to yours.
- **Responding to your condition:** The adjustable settings can be customized to your individual needs.
- **Improving your quality of life:** ResMed’s range of ventilators have been specially designed for whisper-quiet therapy and to help improve your quality of life.
How does NIV work?

- ResMed NIV devices support your breathing by providing a predetermined level of pressure support when you breathe in (inhalation) and less pressure when you breathe out (exhalation).

- Pressure support (the difference between the inhalation and exhalation pressures) increases the amount of air moving in and out of your lungs.

- The steady, lower pressure keeps your airway and alveoli open and to clears out exhaled CO$_2$ through a vent in the mask.

**Inhalation**

NIV device provides predetermined pressure support

**Exhalation**

Exhaled CO$_2$ is cleared out through the mask vent

NIV device applies less pressure
What does therapy involve for me?

- Your clinician may prescribe NIV therapy for use at night while you sleep. And in some cases, they may recommend daytime use as well.

- Therapy involves wearing a mask that is specially selected to suit your facial features and nasal structure. You can choose from ResMed’s broad range of high quality masks to complement your ventilation device for optimal therapy outcomes.

- Your specialist or clinician determines the necessary therapy settings on your device.

- Depending on your condition, therapy may also involve periodic review of your progress. Your specialist or clinician determines whether any adjustments or changes are necessary over time.

- NIV therapy is often part of a comprehensive care program. This may include one or more of a range of remedial measures, such as proper nutrition, physical therapy, pulmonary rehabilitation, oxygen supplementation and medication.
How can I familiarize myself with NIV?

Getting accustomed to your therapy is well worth the effort and is important for your health and well-being. A few simple steps, detailed below, can help you.

Step 1
When starting therapy, hold the mask in your hand (do not put it on yet). Connect the mask to the tubing and the tubing to the ventilator. Then turn on the ventilator.

Step 2
Now hold the mask to your face and take a few deep breaths, in and out (through your nose if you’re using a nasal mask). When there is air leakage around the mask, the ventilator automatically generates a higher airflow to compensate.

Step 3
After about 5-10 consecutive breaths, when you feel confident breathing on your device, put on the mask system. If you use your ventilator while lying down, tighten or loosen the headgear straps as required, so that the mask seals. Finding the right balance between seal and comfort is critical, so balancing strap tension is important. Remember that your ventilator instantly responds to leaks, so you don’t need to overtighten the mask around your head. ResMed’s headgear can be easily attached or detached from the mask, so it is easy for you to take your mask off quickly at any time.

Step 4
Once you manage to breathe for 30–40 minutes at a time, try using therapy at night while you sleep. You may wake up after a few hours, but you will soon get accustomed to the therapy. If the mask does not seal or remains uncomfortable, consult your NIV specialist—a number of solutions are available.